CLAIMS

1. An optical shuffle/interconnect system, comprising:

an imaging system defining an input plane and an output plane;

means affixed to said imaging system proximate one said plane for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane; and

said spatial component rearranging means comprising at least one surface used for said rearranging of said spatial components of said object.

2. The optical shuffle/interconnect system as defined in claim 1 wherein said imaging system is in the form of a gradient index rod lens.

3. The optical shuffle/interconnect system as defined in claim 1 wherein said imaging system is in the form of an optical data pipe.

4. The optical shuffle/interconnect system as defined in claim 1 wherein said at least one said surface is either diffractive or refractive.

5. The optical shuffle/interconnect system as defined in claim 1 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

6. The optical shuffle/interconnect system as defined in claim 4 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

7. An optical shuffle/interconnect system, comprising:

an imaging system defining an input plane and an output plane;

means incorporated into said imaging system proximate one said plane for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane; and

said spatial component rearranging means comprising at least one surface used for said rearranging of said spatial components of said object.

8. The optical shuffle/interconnect system as defined in claim 7 wherein said imaging system is in the form of a gradient index rod lens.

9. The optical shuffle/interconnect system as defined in claim 7 wherein said imaging system is in the form of an optical data pipe.

10. The optical shuffle/interconnect system as defined in claim 7 wherein said at least one said surface is either diffractive or refractive.

11. The optical shuffle/interconnect system as defined in claim 7 wherein spatial components of said rearranged image

are a perfect shuffle of said spatial components of said object.

12. The optical shuffle/interconnect system as defined in claim 11 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

13. An optical shuffle/interconnect system, comprising:

an imaging system made up of a first component and a second component, said first component and said second component being spaced apart from one another;

one said component defining an input plane and another said component defining an output plane;

means affixed to said imaging system proximate one said plane for rearranging spatial components of an object located proximate said input plane into a rearranged image within said output plane; and said spatial component rearranging means comprising at least one surface used for said rearranging of said spatial components of said object.

14. The optical shuffle/interconnect system as defined in claim 13 wherein said first component and said second component of said imaging system are each in the form of a gradient index rod lens.

15. The optical shuffle/interconnect system as defined in claim 13 wherein said first component and said second component of said imaging system are in the form of an optical data pipe.

16. The optical shuffle/interconnect system as defined in claim 13 wherein said at least one said surface is either diffractive or refractive.

17. The optical shuffle/interconnect system as defined in claim 13 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.

18. The optical shuffle/interconnect system as defined in claim 17 wherein spatial components of said rearranged image are a perfect shuffle of said spatial components of said object.